

CLAIMS

1. A conductive member comprising a resin including an electric conductor, wherein

the electric conductor includes mainly at least any one element of the following elements (a), (b) and (c);

(a) element: a residual material of a synthetic carbonaceous material including fullerenes generated in the preparation process of fullerenes from which at least a part of the fullerenes is removed,

(b) element: a compound having a molecule skeleton formed of a carbon cluster, which has at least one 5-membered ring, at least one 6-membered ring and has an open end,

(c) element: a carbonaceous compound having a non-peak distribution due to its amorphous structure in a region where 2θ is 30° or less in an X-ray diffraction spectrum.

2. The conductive member according to claim 1, wherein the synthetic carbonaceous material including the fullerenes is generated via a predetermined arc discharging method or a predetermined combustion method.

3. The conductive member according to claim 1, wherein the electric conductor includes oxygen atoms of 0.5 to 30 mass% and hydrogen atoms of 0.05 to 1 mass%.

4. The conductive member according to claim 1, wherein a plurality of conductor particles having resin particles formed from the resin and a conductive layer formed on the surface of the resin particles and formed from the electric conductor are piled up.

5. The conductive member according to claim 1, wherein the

electric conductor is dispersed in the resin.

6. A manufacturing method of a conductive member formed from a resin including an electric conductor, comprising:

5 a particle forming step in which resin particles are formed from the resin;

a coating step in which the resin particles are brought into contact with a conductor solution including mainly at least any one element of the following elements (a), (b) and (c) being dissolved or dispersed in a solvent;

10 (a) element: a residual material of a synthetic carbonaceous material including fullerenes generated in the preparation process of fullerenes from which at least a part of the fullerenes is removed,

(b) element: a compound having a molecule skeleton formed of a carbon cluster, which includes at least one 5-membered ring and at least one 6-membered ring and has an open end,

15 (c) element: a carbonaceous compound having a non-peak distribution due to its amorphous structure in a region where 2θ is 30° or less in an X-ray diffraction spectrum, to adhere the conductor solution to at least a part of the surface of the resin particles; and

20 a removal step in which the solvent is removed from the conductor solution adhered to the resin particles.

7 A manufacturing method of a conductive member formed from a resin including an electric conductor, comprising:

25 a blending step in which a conductor solution including mainly at least any one element of the following elements (a), (b) and (c) being dissolved or dispersed in a solvent;

(a) element: a residual material of a synthetic carbonaceous material including fullerenes generated in the preparation process of fullerenes from which at least a part of the fullerenes is removed,

(b) element: a compound having a molecule skeleton formed of a carbon cluster, which includes at least one 5-membered ring and at least one 6-membered ring and has an open end,

(c) element: a carbonaceous compound having a non-peak distribution due to its amorphous structure in a region where 2θ is 30° or less in an X-ray diffraction spectrum and a monomer solution including a monomer constituting the resin or a resin solution dissolved with the resin in a solvent are blended, and

a polymerizing step in which the monomer included in the monomer solution is allowed to polymerize to form the resin, or the resin included in the resin solution is cured.

8. The manufacturing method of the conductive member according to claims 6 or 7, wherein, as the synthetic carbonaceous material including the fullerenes, the synthetic carbonaceous material generated via a predetermined arc discharging method or a predetermined combustion method is used.

9. The manufacturing method of the conductive member according to claims 6 or 7, wherein, as the electric conductor, the electric conductor including oxygen atoms of 0.5 to 30 mass% and hydrogen atoms of 0.05 to 1 mass% is used.

10. An electric device having a conductive member including a resin and an electric conductor, comprising:

an electrode couple; and

a conductive member, which is provided between the electrodes constituting the electrode couple and formed from a resin including an electric conductor including mainly at least any one element of the following elements (a), (b) and (c);

5 (a) element: a residual material of a synthetic carbonaceous material including fullerenes generated in the preparation process of fullerenes from which at least a part of the fullerenes is removed,

(b) element: a compound having a molecule skeleton formed of a carbon cluster, which has at least one 5-membered ring, at least one 6-
10 membered ring and has an open end,

(c) element: a carbonaceous compound having a non-peak distribution due to its amorphous structure in a region where 2θ is 30° or less in an X-ray diffraction spectrum.

11. The electric device according to claim 10, wherein the synthetic
15 carbonaceous material including the fullerenes is generated via a predetermined arc discharging method or a predetermined combustion method.

12. The electric device according to claim 10, wherein the electric
20 conductor includes oxygen atoms of 0.5 to 30 mass% and hydrogen atoms of 0.05 to 1 mass%.

13. A manufacturing method of an electric device having a conductive member including a resin and an electric conductor, comprising:

25 a particle forming step in which resin particles are formed from the resin;

a coating step in which the resin particles are brought into

contact with a conductor solution including mainly at least any one element of the following elements (a), (b) and (c) being dissolved or dispersed in a solvent;

5 (a) element: a residual material of a synthetic carbonaceous material including fullerenes generated in the preparation process of fullerenes from which at least a part of the fullerenes is removed,

(b) element: a compound having a molecule skeleton formed of a carbon cluster, which includes at least one 5-membered ring and at least one 6-membered ring and has an open end,

10 (c) element: a carbonaceous compound having a non-peak distribution due to its amorphous structure in a region where 2θ is 30° or less in an X-ray diffraction spectrum to adhere the conductor solution to at least a part of the surface of the resin particles;

15 a removal step in which the solvent is removed from the conductor solution adhered to the resin particles;

a conductive member forming step in which the conductive member is formed by piling up a plurality of resin particles from which the solvent is removed; and

20 a disposing step in which the conductive member is disposed between the electrodes constituting the electrode couple.

14 A manufacturing method of an electric device having a conductive member including a resin and an electric conductor, comprising:

25 a blending step in which a conductor solution including mainly at least any one element of the following elements (a), (b) and (c) being dissolved or dispersed in a solvent;

(a) element: a residual material of a synthetic carbonaceous material including fullerenes generated in the preparation process of fullerenes from which at least a part of the fullerenes is removed,

5 (b) element: a compound having a molecule skeleton formed of a carbon cluster, which includes at least one 5-membered ring and at least one 6-membered ring and has an open end,

(c) element: a carbonaceous compound having a non-peak distribution due to its amorphous structure in a region where 2θ is 30° or less in an X-ray diffraction spectrum and a monomer solution including a monomer constituting the resin or a resin solution dissolved with the resin in a solvent are blended,

10 a polymerizing step in which the monomer included in the monomer solution is allowed to polymerize to form the resin, or the resin included in the resin solution is cured; and

15 a disposing step in which the conductive member is disposed between the electrodes constituting the electrode couple.

15. The manufacturing method of the electric device according to claim 13 or 14, wherein, as the synthetic carbonaceous material including the fullerenes, the synthetic carbonaceous material generated via a predetermined arc discharging method or a predetermined combustion method is used.

20 16. The manufacturing method of the electric device according to claim 13 or 14, wherein, as the electric conductor, the electric conductor including oxygen atoms of 0.5 to 30 mass% and hydrogen atoms of 0.05 to 1 mass% is used.